Operating Instructions & Technical manual WG Dental oil-less air compressor

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1. Brief Introduction

WG air compressor features compact structure, stable performance, large flow rate, easy operation and maintenance. Particularly the machine can be running without lubricant oil so that the compressed air from the machine does not contain any oil fume; air can be obtained, Because the air for dental apparatus must not contain any oil, this machine can be used as an independent air supply machine for dental therapeutic apparatus; also can be used in other areas such as medical care, scientific research, industrial production and daily life.

In order to keep peace and quiet in therapeutic room a silencing box is specially designed for the air compressor (See Fig. 1) making therapeutic environment better.

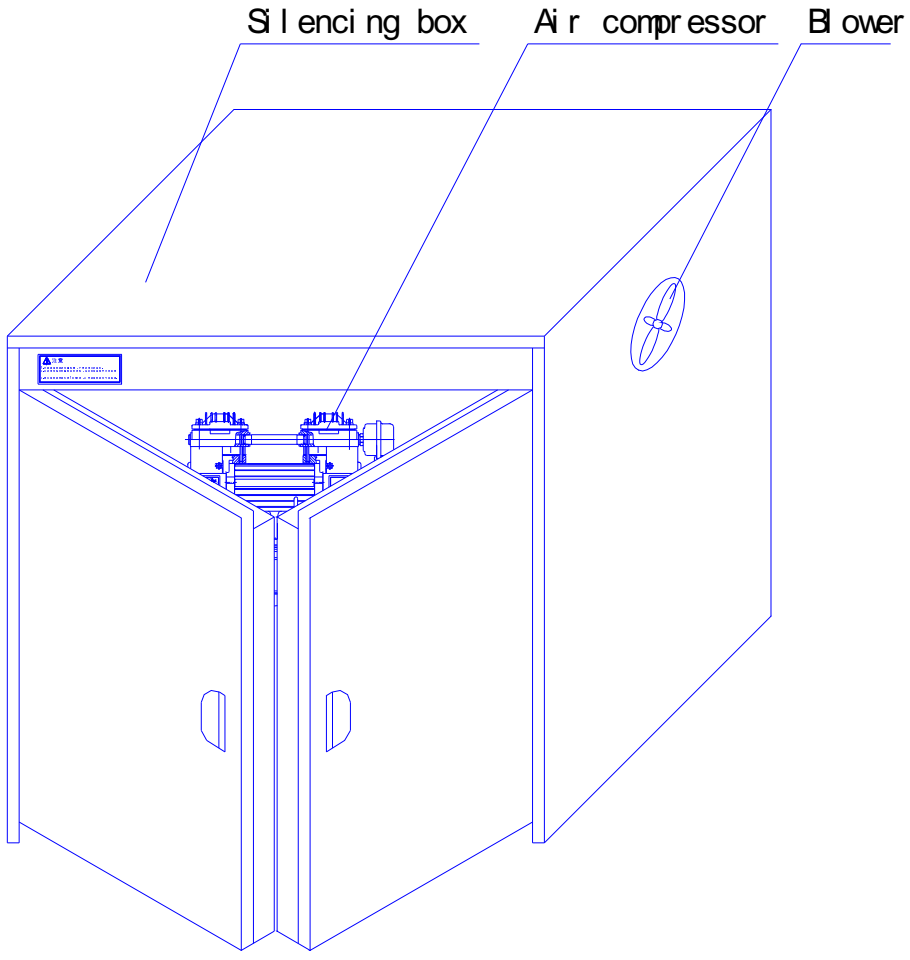


Fig. 1 Silencing box

2. Machine Structure

(1) Mechanics

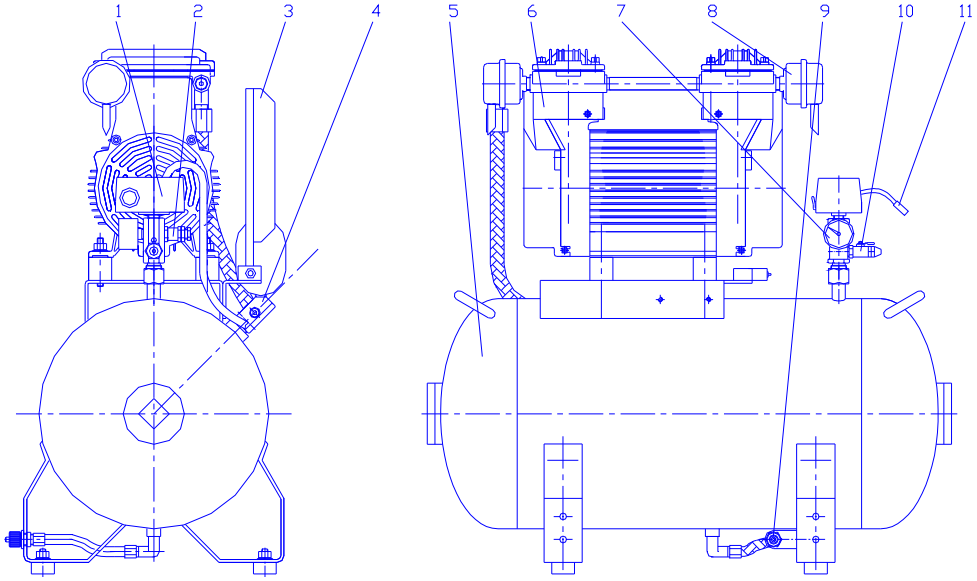


Fig.2 Structure of Air Compressor

1. Pneumatic control switch
2. Safety valve
3. Switch box
4. One way valve
5. Air tank
6. Compression machine
7. Barometer
8. Filter
9. Drainage valve
10. Air supply valve
11. Power supply cable (for blower in silencing box)

The structure of WG series oil-less air compressor is shown in Fig. 2. All units in the machine sit on a cylindrical pressure vessel called air tank. Compression machine is main part of the air compressor. A motor drives directly the eccentric wheel-connecting bar system making the piston move reciprocally. The piston is made from high temperature resistant and abrasion resistant non-metal material and is able to work without lubrication for a long time. Compressed air discharged enters in the air tank, a barometer displays the pressure in the tank. When the pressure inside rises to 0.75 MPa, power is automatically cut off by a pneumatic control switch, the compressor is shut off. When the pressure inside lowers to 0.45 MPa, power is turned on by the pneumatic switch, the compressor starts again and the pressure in the tank gradually rises again. This happens repeatedly. The high quality

compressed air can be supplied to dental therapeutic instrument. In addition air supply valve, drainage valve, safety valve and electrical switch box are installed on the air tank.

WG series oil-less air compressor is classified as a single head. This compressor includes an air drier in the machine.
The air passage in WG series air compressor is shown in Fig.8 (where dotted line is air-drying system, it is an option and can be installed on request from customers).

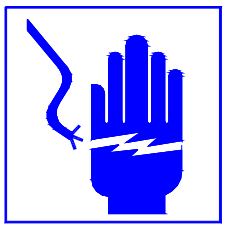
(2) Electrical

WG series oil-less air compressor is equipped with switch box with starter inside. Each head is equipped with one switch box. The electrical wiring for the functions like start protection is shown in Fig. 7.

3. Main Technical Specification: WG Air Compressor

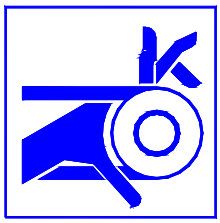
Rated air displacement (L/min)	Max. air pressure (MPa)	Power supply	Rated power (KW)	Rated current (A)	Safety valve activating pressure (MPa)	Pressure controlled valve activating pressure (MPa)	Volume of air tank (L)	Volume mm^3 (L×W×H)	Weight (kg)	Fuse (A)
185	0.75	220±10 %V 50±1Hz	1.1	5	0.88	0.75/0.45	28	640×440×640	40	15

4. Explanation of Marks



Electrical shock!

Hot!



No touching!

High Pressure!

Grounding Protection

B Type Equipment

Notice! Check Random Document

5. Transportation and Storage

The machine should be transported and stored in following condition:

Ambient temperature: -40□~55□
Relative humidity: ≤95%
Atmosphere pressure: 500HPa~1060HPa

6. Installation, Test and Operation

(1) Installation:

a. The machine should be operated in the room with temperature of 5~40 and relative humidity of greater than 80% .Surrounding area of the machine should be clean, dry, free of corrosive gas, well ventilated and no direct sunlight.

b. The machine should be horizontally installed on firm ground with the special silencing box installed on its top. And so the equipment will be placed according to fig.3. Both right and left space between the box and wall is above 10 cm.

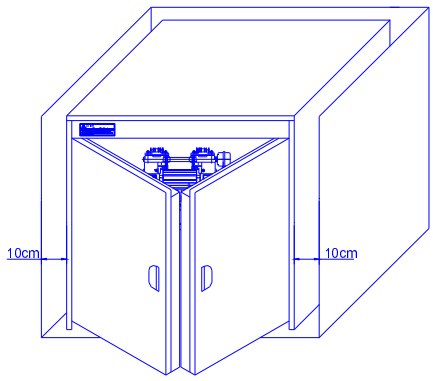


Fig.3 The condition of a equipment used

c. Power used: Single phase: 220±22V, 50Hz±1Hz

Note: Special power line for the machine is recommended with short circuit protection and reliable grounding device. The section area of power cable and melt current of fuse are as follows:

Section area of power cable <= 1.5mm^2
Melt current = 15A
Socket rating = 10A

d. After unpacking, check the machine for any missing parts and damages, check accessories and spare parts and technical document supplied together with the machine according to the packing list.

e. Connection of air pipes: connect air supply pipe with the joint of air supply valve of the

machine (See Fig. 2.10) and fasten it with a hoop.

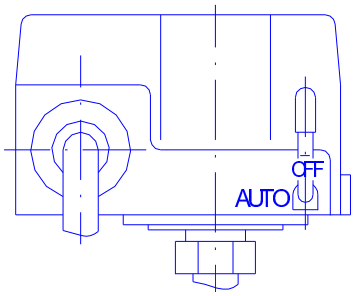


Fig.4 Pressure controlled Switch at off position

f. Check if drainage valve is off and if pressure controlled switch is at the position of “off” (Switch off position). See Fig. 4.

g. Electrical connection: Check if power supply is normal (Power supply voltage: For single phase, should be 198~242V. Insert the plug for the machine into power supply socket. Installation of the machine is completed.

(2) Test run of the machine

a. Close drainage valve (Fig.2.9) and air supply valve (Fig.2.10). Check if the reading of barometer (Fig.2.7) is below 0.45 MPa. Turn the operation handle of pressure controlled switch to “AUTO” (see Fig.5) the machine will start immediately. The reading of barometer will slowly rise with increasing pressure inside the air tank. When the reading of barometer reaches 0.75 MPa, pressure controlled switch activates, the power supper is cut off, machine stops running. At the same time the load-releasing valve of pressure controlled switch activates to lower high pressure in the cylinder of compression machine so that the machine can be started again; during the period when the machine stops running observe if the reading of barometer is decreasing. If there is no leakage of air in the machine, open air supply valve to begin supply of compressed air. When the pressure in the air tank decreases to 0.45 MPa, pressure controlled switch resets and power supply resumes, the machine starts running again. The pressure in air tank increases again. If the machine can automatically stop and start the machine works normally.

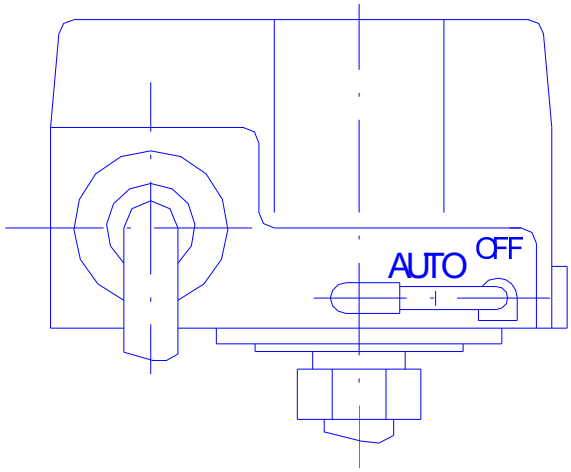


Fig.5 Pressure controlled switch at running position

b. Turn the operation handle for pressure controlled switch to “off” position (Switch off position), then pull out the plug of the machine. Test run is completed.

(3) Operation

a. To operate WG series oil-less air compressor correctly and safely read carefully this operation instruction.

b. Connect the power cable for the axial flow blower in the machine (see Fig.2.11) with the power cable for the axial flow blower in silencing box.

c. Insert the plug of the machine in power socket of single phase 10A. Open air supply valve, turn the operation handle for pressure controlled switch to “AUTO” position, the machine will run in a normal condition.

7. Maintenance

(1) Draining of air tank

When the air compressor is running, the vapour in the air is condensed in the air tank. Excess water would affect air quality in air tank, and would affect normal work of the equipment using compressed air. Therefore accumulated water in the air tank must be drained off regularly. The frequency for draining is depended on environment condition and operation time, but usually once every 2-3 days. The way to drain off the condensate is as follows: Put the pipe connecting drainage valve in a container, with compressed air in the air tank, slowly turn counter clockwise the knob on the drainage valve to drain off the water in the air tank until all accumulated water comes out from the pipe. After that turn tightly clockwise the knob to ensure no leakage

(2) Change of filter

An air filter is installed on air inlet of the air compressor (see Fig.2.8) to prevent the dust in the air from entering the air compressor and reduce noise. After used for a period of time the filter core in the air filter will get clogged. In a result sucking capacity of the air compressor will be reduced, therefore the filter core must be replaced regularly. The way of replace is as follows: open the lid on the air filter, take out the old filter core, put in a new one, then close the lid.

(3) Adjustment of pressure controlled switch

Pressure controlled switch is used for controlling stop and start of the air compressor to ensure correct pressure of compressed air in the air tank. If the pressure of compressed air in the air tank is found not to be in the range set by the manufacturer (set value: the pressure at which the air compressor will stop running is 0.75 MPa ±0.015 MPa; the pressure at which the air compressor will start running is 0.45 MPa±0.015 MPa) the pressure controlled switch must be adjusted again to set correct activation value. The way to adjust is as follows. Open the casing for the pressure controlled switch (See Fig.2.1); adjust the setting screw for maximum pressure (Turning clockwise makes activation pressure higher, so the pressure at which the air compressor stops running will be higher) and the setting screw for pressure difference. (Turning clockwise makes larger pressure difference, that is, the difference between the pressure at which the air compressor starts and the pressure at which the air compressor stops is larger) respectively. Careful adjustment will make the activation pressures within the range set by the manufacturer.

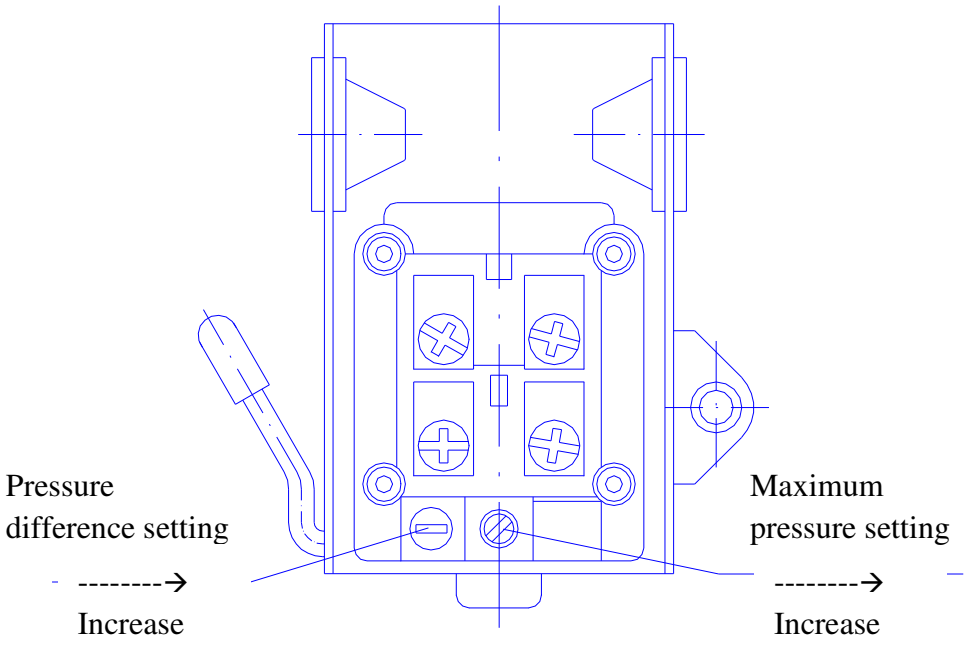


Fig.6 Adjustment of pressure controlled switch

8. Notices

(1) The power supply for the machine is 220±22v and 50Hz single phase. To ensure the air compressor working normally, for the machine using single phase power a voltage stabiliser for single phase power must be provided.

(2) If power cut happens when the machine is running the operation handle of pressure controlled switch should be turned to “off” position. When power supply resumes turn the operation handle of the pressure controlled switch to “AUTO” position.

(3) Closely watch all safety mark to avoid injuries like scald, electrical shock etc.

(4) Drain off water in the air tank regularly and frequently brush off the dust on the radiator.

(5) Check the air filter regularly, replace filter core on time.

(6) Any trouble or failure should be checked and fixed by specialized technicians.

9. Troubleshooting

No.	Trouble	Reasons	Check	Remedy
1	The air compressor does not start	1. No power supply or fuse failure	Check power supply and fuses	Restore power supply and change fuses
		2.Pressure controlled switch is not turned to "AUTO" position	Check position of pressure controlled switch	Turn handle to "AUTO" position
		3.Failure of starter	Check if starter works normally	Change starter
		4.compression machine clamps	Check if motor rotates smoothly	Fix motor and its driving system
		5.Temperature protector of compressor motor activates	Check if temperature protector activates	Fix according to overloading and failure of temperature protector
2	Hard to start	1.Too low the power voltage	Check if power voltage is higher than 198V	Provide voltage stabilizer
		2.Failure of starter capacitor	Check if starter capacitor fails	Change starter capacitor
3	Pressure does not rise while compressor keeps running	1.Too high the air consumption	Check if compressor meets requirement for air consumption	Reduce air consumption or use compressor with larger air displacement
		2.Severe leakage of air in pipe line	Check if there is leakage	Stop leakage
		3. Failure of compression machine	Check if compression machine works normally	Change compression machine
		4.Too low setting of safety valve	Check if safety valve is normal	Change safety value or adjust safe pressure to 0.88 MPa
4	Too frequent start and stop	1.Incorrect activation value of pressure controlled switch	Check activation value of pressure controlled switch	Change pressure controlled switch or adjust activation pressure to 0.75 MPa/0.45 MPa
		2. Too much Water in air tank	Check if compressed air contains water	Drain off water in air tank
5	When the power is switched on the machine does not operation	1. There are troubles in the supply power	The power circuit will be checked by the electrical engineer	According the reason of trouble replace the faulty element
		2. when the machine is in service , it stops or does not operate suddenly	In the metal silencing box the fan is fault and the temperature was rising	Replace the blower
			The main equipment of the system has trouble	Replace the compressor

10. Accessories and Spare Parts

(1)	Compressor system with single head		
	WG series	φ8 PU pipe	3 (3m)
		08-02 quick joint	1 set
		φ8-G1/4 quick joint	1
		G1/4□-G1/2 screw joint	1
(2)	Fuses for WG	15A	2

11. Electrical Circuit

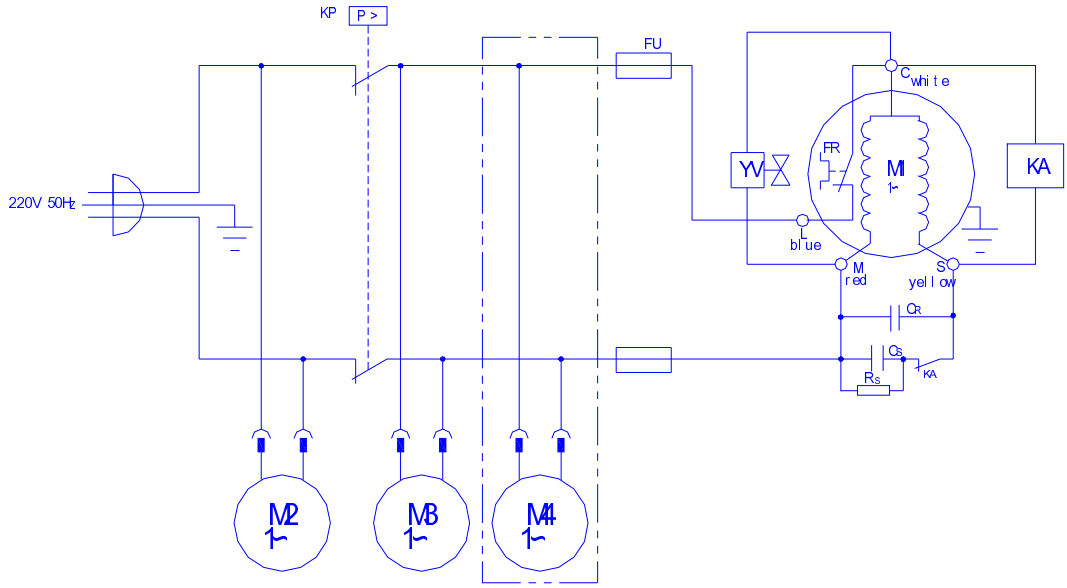


Fig .7 The electrical circuit

12. Air passage Drawing

(1) Single head machine:

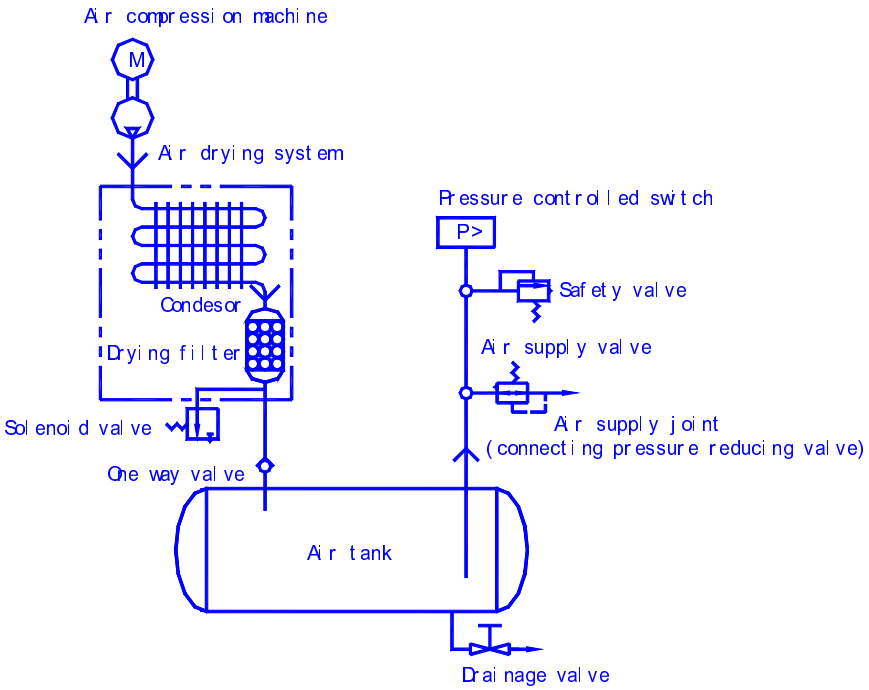


Fig .8 The air current drawing

13. The Drawing of the Compressor Structure (Version 1)

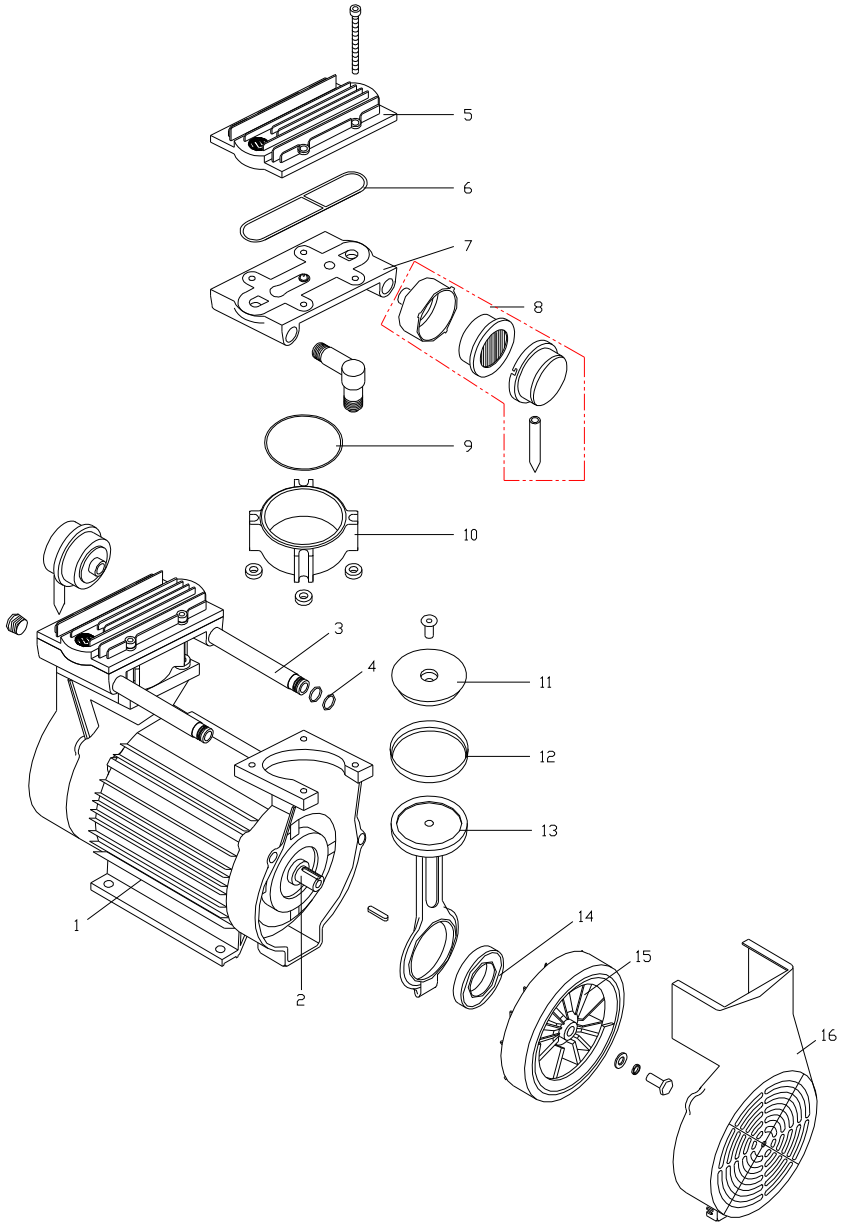
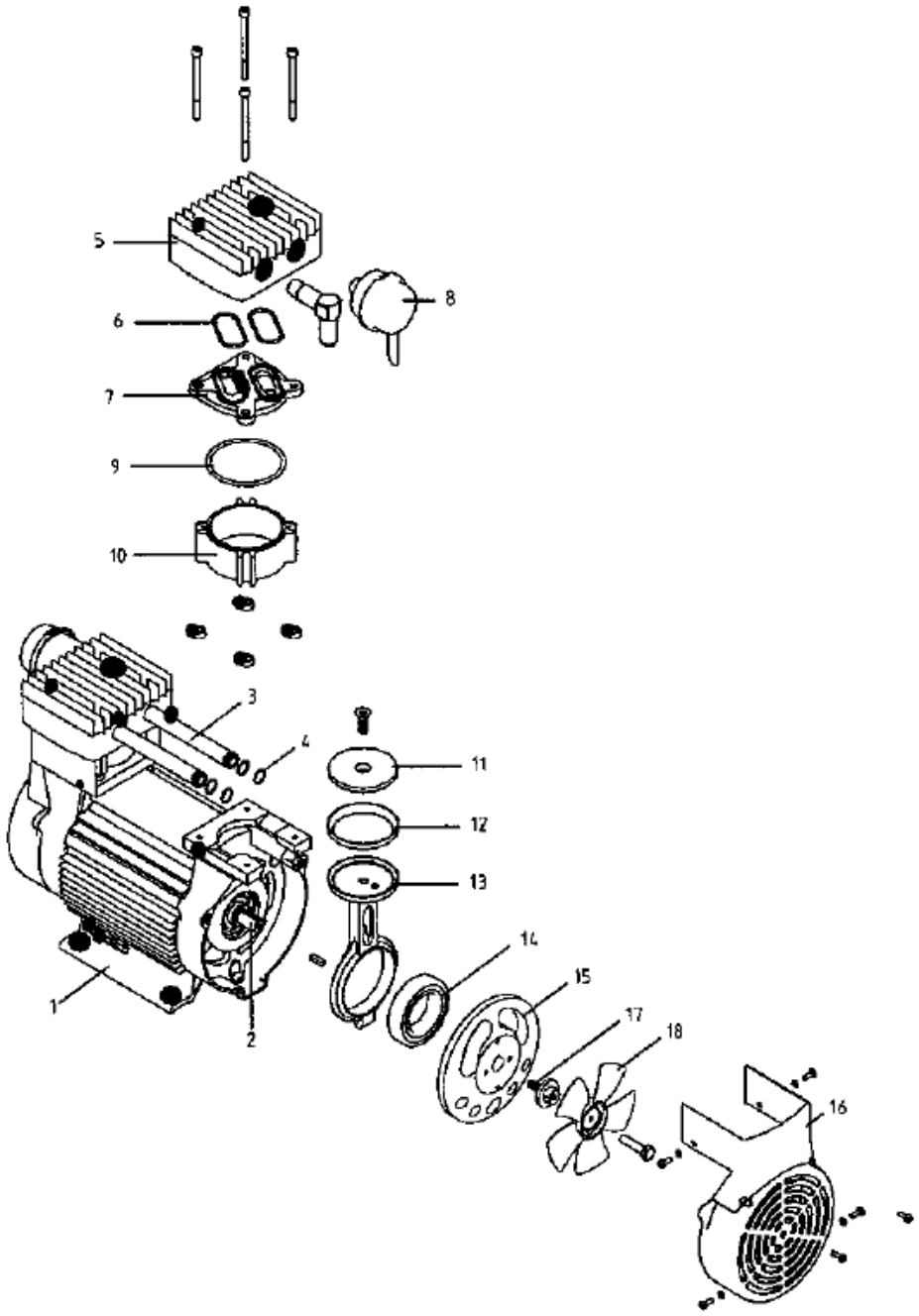


Fig.9 The drawing of the compressor

1. Motor 2. Rotor Spindle 3. Windpipe 4. Ring 5. Cylinder cover 6. Sealing 7. Cylinder Head
8. Air filter (refill) 9. Rubber Ring 10. Cylinder body 11. Fitting 12. Piston ring 13. Link
14. Bearing 15. Eccentric 16. Casing

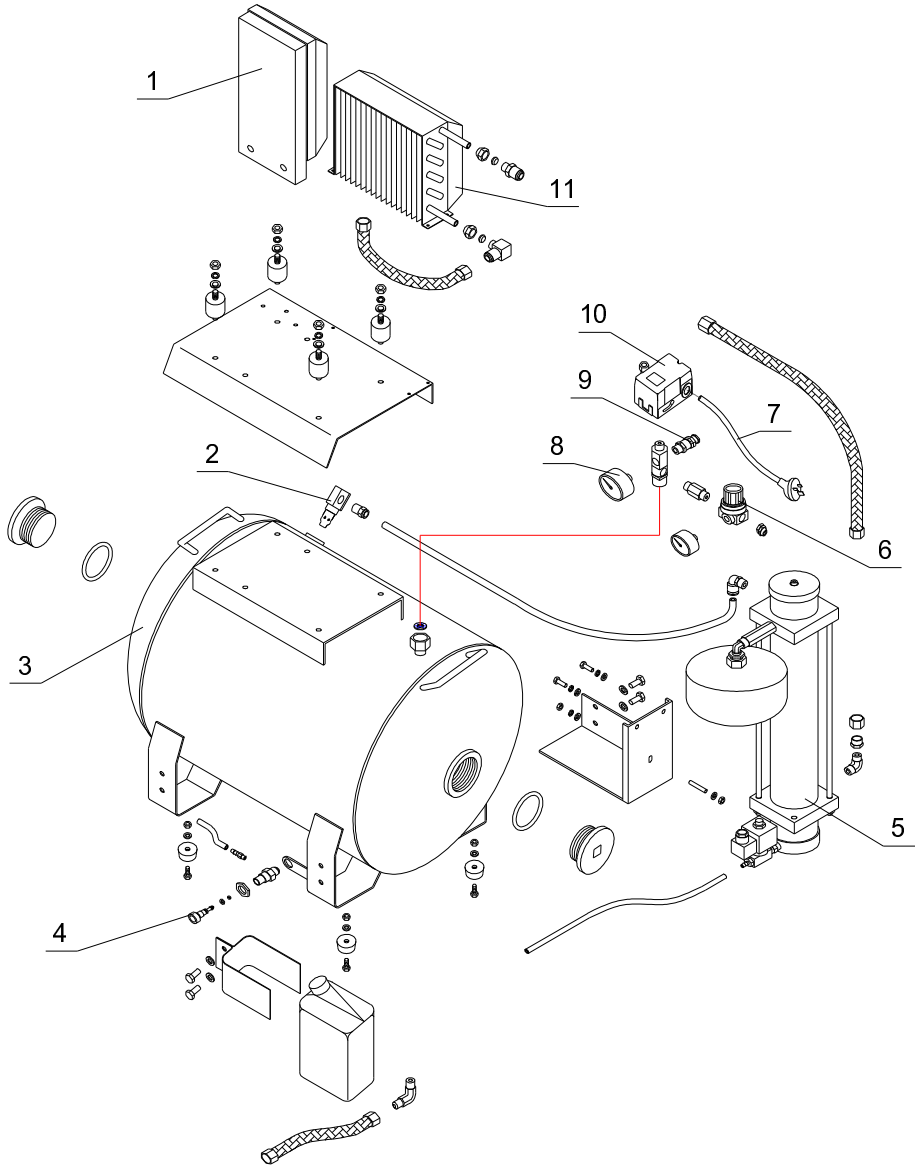
14. The Drawing of the Compressor Structure (Version 2)



Position	Part number	Description
1	KW185-30.950	MOTOR
2	KW185-30.005	ROTOR SPINDLE
3	KW185-00.006	WINDPIPE
4	KW185-	RING
5	KW185-A40.001B	CYLINDER COVER

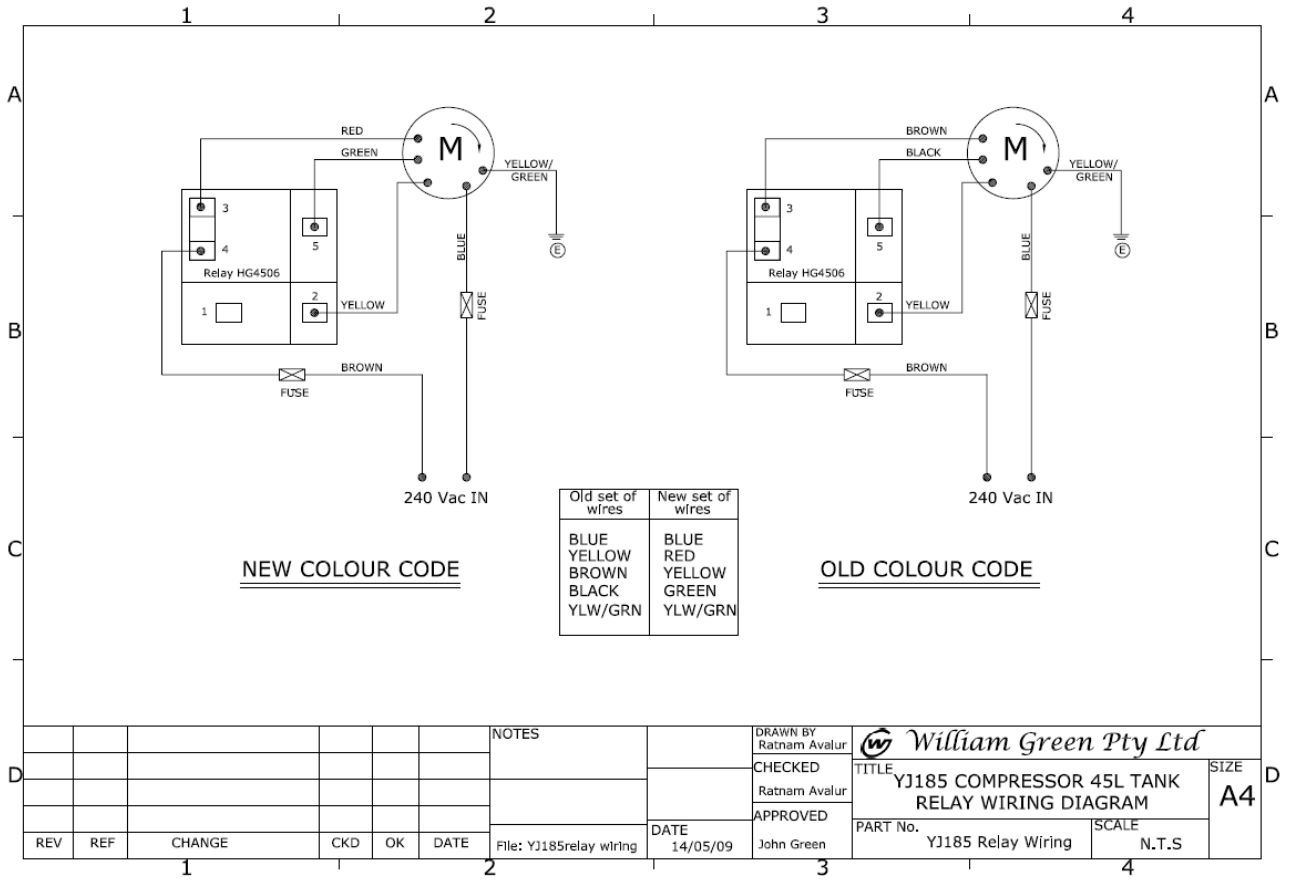
6	KW185-A00.004	SEALING
7	KW185-A20.001	CYLINDER HEAD
8	KW185-00.008	AIR FILTER
9	KW185-00.003	RUBBER RING
10	KW185-00.005	CYLINDER BODY
11	KW185-10.001	FITTING
12	KW185-10.002	PISTON RING
13	KW185-10.003	LINK
14	KW185-NSK6009V	BEARING
15	KW185-A00.001	ECCENTRIC
16	KW185-00.011	CASING
17	KW185-00.013	FAN CONNECT
18	KW185-00.012B	FAN

15. The drawing of the system



1. Electrical switch box
2. Retaining valve
3. Air tank
4. Drainage valve
5. Air-drying system (order part for customer)
6. Air supply valve
7. Power cable
8. Barometer
9. Safety valve
10. Pneumatic control switch
11. Condenser (order part for customer)

15. Appendix


RED
GREEN
YELLOW/ GREEN
M
BLUE
FUSE
Relay HG4506
YELLOW
BROWN
FUSE
240 Vac IN
NEW COLOUR CODE
BROWN
BLACK
YELLOW/ GREEN
M
BLUE
FUSE
Relay HG4506
YELLOW
BROWN
FUSE
240 Vac IN
OLD COLOUR CODE
Old set of wires
New set of wires
BLUE
YELLOW
BROWN
BLACK
YLW/GRN
BLUE
RED
YELLOW
GREEN
YLW/GRN
NOTES
File: YJ185relay wiring
DRAWN BY Ratnam Avalur
CHECKED Ratnam Avalur
APPROVED John Green
DATE 14/05/09
William Green Pty Ltd
TITLE YJ185 COMPRESSOR 45L TANK RELAY WIRING DIAGRAM
SIZE A4
PART No. YJ185 Relay Wiring
SCALE N.T.S
REV
REF
CHANGE
CKD
OK
DATE